

THE CONCEPT OF DEATH

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I. INTRODUCTION

Death is not a momentary leap.

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In the early morning hours of December 3, 1967, Louis Washkansky received a new heart. Since the announcement of that operation, the idea of transplanting human organs from one person to another has fascinated the world. It has also raised for public discussion the question, among others, of what is meant by the term "death." Basically, how could the person whose heart was implanted into Mr. Washkansky's chest be dead when that person, rather clearly, had a viable and functional heart?

We shall attempt to analyze in this paper the legal aspect of this question. In order to do this it will be necessary first to explore the medical principles relating to the physiology of death. Only after these medical principles are understood will it be profitable to analyze the legal problems created by their application. Legal doctrine and theory can be useful as a guide to action only in relation to the facts which set the parameters of the problem and the alternatives available.

Until very recent times the physician and the layman alike used the same criteria for determining when a person crossed the seemingly clear-cut border between life and death. When a person's heart stopped beating and he stopped breathing, he was dead; this phenomenon is usually termed "clinical death." The standard is based on the medical fact that respiration, heart action, and brain function are closely related to each other, and the cessation of any one of them will bring the other two to a halt within a very few minutes. Indeed, this standard has been so pervasive that one looks in vain for any legal definition of death.

In recent years, however, a whole group of life-supporting devices and techniques have become available. These machines have modified the earlier, unconditional interplay of circulation, respiration, and brain activity. It is now possible to compensate for defi-

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ciencies in heart action or respiration in some situations. A major problem occasioned by advances in life support techniques is determining when these machines may be turned off and removed from the patient whose brain is permanently unable to function.

At the same time medical science is rapidly expanding the list of body parts which it can successfully transplant from one person to another. On the basis of extensive work on dogs and other animals, and in many cases substantiated by trials in man, the technical feasibility of transferring bone, bone marrow, lymphoid tissue, cartilage, extensive areas of skin, corneas, some endocrine organs such as ovaries and the parathyroid, kidneys, hearts, lungs, livers, the uterus, segments of small intestine, and even entire limbs is firmly established.¹ With this advance, the point of death takes on the added importance of determining when a physician may remove vital organs needed for transplantation into the recipient patient.

Having stated what issues we shall be concerned with, it is important to note here certain issues with which we are not concerned. First is the question of consent by the donor or next of kin for removal of the organs after death. In the absence of a clear statute² the problem of obtaining the necessary permission for the removal of the organs is at best difficult.³ This paper will assume that the necessary consent has been obtained for the removal of the desired organs.

Second, we are not concerned with euthanasia. The term "euthanasia" implies the artificial shortening of a *life* which would otherwise continue. When discussing euthanasia, it is assumed that one knows when the victim is dead or alive. The problem faced in this paper is one step removed: When is the patient alive, in which case treatment will continue, or dead, in which case even treatment will cease.⁴

¹ Billingham, *Tissue Transplantation; Scope and Prospect*, 153 *SCI.* 266, 267 (1966).

² *E.g.*, VA. CODE ANN. § 32-364.1 (1950); OHIO REV. CODE ANN. §§ 2108.01-2108.03 (Page 1967).

³ *E.g.*, *Masden v. Harrison*, Equity No. 68651, (Pa. Sup. Jud. Ct., June 12, 1957); *Huskey v. Harrison*, Equity No. 68666, (Pa. Sup. Jud. Ct., Aug. 30, 1957); *In re Edwin Dickinson* (P. Ct. of Darien, Conn., Nov. 4, 1960). *Cf.*, *Brown v. Broome County*, 8 N.Y.2d 330, 170 N.E.2d 666 (1960). *See also*, C. WASMUTH, *LAW FOR THE PHYSICIAN* 450-460 (1966). *Cf.* the question of relative's consent *infra* note 36.

⁴ In practice, the distinction may not be as clear as stated above. A subtle change of the definition of "life" or "death" could be of critical importance in any given case charging euthanasia. Indeed, this is one reason why there must be an agreed definition of "death" and "life."

Having the benefit of these preliminary observations, we shall turn first to an examination of certain salient medical facts in the field of physiology which have challenged our concept of death and, second, to an analysis of the legal problems which arise from the application of these principles by the physician in determining the time of death.

II. THE MEDICAL PARAMETERS

The basic medical phenomenon is simply stated: The various types of cells in the body succumb to a lack of oxygen at different rates. Certain brain cells cannot withstand an interruption in circulation, and therefore oxygen supply, for more than three to six minutes. Other cells are viable 24 hours after cessation of circulation.

However, we are concerned with considerably more than the mere survival of a given type of cell. The cell must be able to resume its normal *functioning*. Cells are organized into groups which have specific tasks to perform. Groups of cells, in turn, may be formed of essentially the same kinds of cells or they may be formed of a great variety of cell types with varying susceptibility to anoxia (lack of oxygen); compare, for example, the kidney to an arm muscle. It is these organized groups of cells which must, as an entity, resume their normal functions.

If we were able to determine the length of time during which such a structured mass of cells (particularly an organ) could continue without oxygen and yet resume its normal functioning upon resumption of its oxygen supply, we would know the time limit from the cessation of circulation which is available before irreversible changes occur in the given organ. This information would indicate, among other things, the length of time during which a transplantation surgeon would be able to remove and perfuse⁵ the organ.

Indeed, a tissue is defined as living when, returned to normal surroundings and blood supply, it will resume its use of oxygen for burning fuel (sugar) so as to carry out all of its normal cellular functions in a normal way. It may be added that "the state of liveliness (known as viability) of all these tissues depends upon the length of time they have lacked blood supply and their temperature during that time."⁶

The critical factors then in preserving the vitality of tissue, for transplantation or otherwise, are time and temperature. *The critical*

⁵ To immerse and suffuse with a nutrient and oxygenated solution.

⁶ F. MOORE, GIVE AND TAKE 133 (1964).

time is that which elapses between the cessation of circulation and its reestablishment. *The critical temperature* is that of the tissue during the ischemic⁷ interval.⁸

The critical temperature for most tissues appears to be around 25° C. (77° F.). Below this temperature, many tissues can be kept alive for several hours without blood flow. If the temperature is reduced to 15° C., (59° F.), or lower to the freezing point, additional preservation is gained, but there are several problems of damage to tissue, particularly if freezing is produced and the cells swell and break.⁹

In seeking the donation of organs or other tissue, the time-temperature curve begins its inexorable demands at the moment circulation ceases. Noncritical tissues can be removed at leisure after death. Their value is not diminished by delay of even several hours. Both skin and cornea must be viable to be useful as grafts, and both benefit from the more rapid cooling afforded by their surface location. When skin is removed in less than 12 hours from the time of death and stored at 4 to 5°C., it survives for at least three weeks; if rapidly frozen and stored at about -8°C., it survives for at least one year. Cornea may be harvested as long as eight hours after death; it is stored at 4°C. and transplanted as soon as possible.

In contrast to the cornea and to skin, kidneys deteriorate rapidly, and in order that they may survive and function, they must be obtained from the donor within an hour of the cessation of circulation at normal body temperature. It has also been established that the kidney will survive ischemic intervals of at least six hours when stored at 5°C. and will often survive for 24 hours if continuously perfused with an oxygenated mixture of autologous blood¹⁰ and balanced salt solution.

One other point might be noted relative to the kidney. As the length of the ischemic interval increases, the damage to the kidney is proportionately increased, albeit temporarily. Since a machine capable of approximating some of the functions of kidneys exists, it is possible to transplant a kidney which, while not capable of resuming its normal functioning immediately upon restoration of circulation, is capable of recovery in the course of a few weeks. At present, the only machine capable of substituting for an organ is

⁷ Period during which blood flow is interrupted.

⁸ F. MOORE, *supra* note 6, at 135.

⁹ *Id.*, at 156.

¹⁰ Blood taken from the donor of the organ.

the "artificial" kidney. Consequently, the advantages of removing organs as near to the time of cessation of circulation as possible is more obvious with organs other than kidneys.¹¹

Notwithstanding the difficulties involved, we may look forward to the transplantation of the liver, lungs, and heart. None of these organs (except for the heart) has been successfully transplanted in man with long-term results. Each is substantially less able to withstand a lack of oxygen than are the kidneys. Here we are speaking more in terms of ten or fifteen minutes from the cessation of circulation, at normal body temperature, rather than an hour. Yet, these transplants must work reasonably well immediately upon insertion, at least with respect to the heart and lungs. It may also be noted that these organs may have begun to become anoxic in the last minutes of the donor's life as the result of faulty circulation and consequent reduction in oxygen supply. Given the critical time frame within which the transplant surgeon has to operate relative to these three organs, this factor of tissue viability is of the utmost importance.

Finally, and of particular interest to the physician who must determine whether to institute further life support measures or to withdraw those presently in operation, there is the problem that the most highly organized cells in the body are brain cells, and that the brain itself is composed of cells varying in complexity and, therefore, varying in their ability to withstand a lack of oxygen. The most highly organized cells in the brain are the nerve cells of the cerebral cortex. At normal body temperature these cells can survive complete arrest of circulation for not more than three to six minutes, after which they degenerate and the cerebral cortex loses the last of its functional vitality.¹² By contrast, the cells found in the mid-brain and brain stem are more resistant to anoxia and will survive for up to fifteen minutes in the absence of oxygen. The significance of these facts will be immediately grasped when it is realized that the thinking or conscious element of man's mental activity takes place in the cerebral cortex of the brain—the area with the least ability to withstand an interruption of oxygen supply. The brain stem on the other hand controls the so-called vital functions, such as respiration and temperature control. In short, anoxia destroys the functioning of the brain in the reverse order as these functions appear on

¹¹ ETHICS IN MEDICAL PROGRESS: WITH SPECIAL REFERENCE TO TRANSPLANTATION 157 (G. Wolstenholme & M. O'Conner ed. 1966) [hereinafter cited as MEDICAL ETHICS].

¹² Nagovsky & Soboleva, *Delaying the Process of Death*, DISCOVERY 1-2 (1964).

the phylogenic ladder.¹³ Respiration is one of the most phylogenically ancient brain functions and is, accordingly, one of the last to go.

In those cases of cardiac arrest in which the patient is revived, the flow of blood has been restored to the brain before the brain was irrevocably damaged. It is for this reason that there is such an urgency for speed and effectiveness in restoring the heart beat after a cardiac arrest. If, however, this cessation of heart beat persists at normal body temperature for more than eight to ten minutes, then . . . the patient is dead because the brain is dead.¹⁴

If a heartbeat is restored after a cardiac arrest, but not before the cells of the cerebral cortex (the thinking center of the brain) have been irreversibly damaged, the patient will never regain consciousness, even though he has a heartbeat (it should be realized that heart action is only partially controlled by the brain or the central nervous system) and he is breathing, with or without the aid of a respirator.

The standard of clinical death (*i.e.*, lack of heartbeat and respiration) is based on the inter-relationship between respiration, heartbeat, and brain activity. If any one of these centers were to stop functioning, the other two would, if left alone, soon cease functioning also.

In the past twenty or thirty years, medical science has found ways of aiding or even totally taking over certain of these functions. The heart-lung machine has been developed to take over the functions of pumping the blood through the circulatory system and of oxygenating that blood. Such a machine is necessary if the surgeon is to be able to stop his patient's heart long enough to repair it. While on this machine, the patient's blood, instead of going through his heart and lungs, is bypassed to the machine. However, the machine does cause slight damage to blood cells passing through it, and a patient can only be kept on it for a period of eight to ten hours.

To aid the heart with an irregular or unduly sluggish beat, the electronic pacemaker has been developed. So long as the tissues of the heart are otherwise in good health, this machine will keep it

¹³ "Phylogeny" refers to the developmental history of animals. Animals with very simple structures lack many of the capacities of more complicated animals. They may lack sight, hearing, smell, and internal temperature control. As animal structures become more complicated, these capacities begin to appear. It is to the order of appearance of such capacities in the more complex animals that "phylogenic ladder" refers.

¹⁴ F. Moore, *supra* note 6, at 132.

beating at a pre-determined rate by means of electrical impulses. To aid the patient who is unable to breathe for himself, respirators are in common use.

These machines, like others that are in use, were designed to meet the situation involving a temporary interference with the patient's own relevant physiologic process. As they came into use, however, physicians found themselves faced with an ethical, moral, and perhaps legal problem of the first magnitude.

The accepted standard of death was that of clinical death; the criterion of brain activity had been left out of the equation. This omission was no doubt due to the fact that until very recently there was no way of diagnosing brain death and, even if there were, it was unnecessary. Now the physician is faced with a situation which until this time had been moot. He found himself maintaining with machines the patient's respiration or heartbeat or both—the very functions the absence of which were the basis for diagnosing and certifying death.¹⁵ In the absence of brain activity was he permitted to turn off the machines? Would he be considered to have killed his own patient by such an act?

The ability of respirators and heart stimulators to maintain the look of life in the face of death (meaning brain death) has prompted Dr. Hamlin to suggest:

The sanctity of human life is not generated by cardiac signs of its presence or absence when the brain is already dead. . . . Certainly the human spirit that emerges in man's unique individuality is the product of his brain, not his heart. The heart is the symbol for love, happy birthday, St. Valentine . . . and sentimental wishful thinking in general.¹⁶

Turning once again to the field of transplanation, it is clear that an organ must be functionally intact if it is to be of any use, thus requiring its removal from the body of the corpse as soon as possible after death. In the case of kidneys, viability is compromised one hour after the cessation of circulation. The heart and lung require earlier removal to be viable. Time therefore is of the essence.

With respect to kidney transplantation (most of the figures available deal with renal transplants, since these are the most common), it has been estimated that in the United States alone, in 1963 over 21,000 patients died from renal disease. Of these, 7500 died from nephritis and nephrosis, both of which can sometimes be suc-

¹⁵ Hamlin, *Life or Death by EEG*, 190 J.A.M.A. 112, 113 (1964).

¹⁶ *Id.*

cessfully treated through transplantation. One may expect that this indicated need for renal transplants will increase both as a function of the general increase in population and added longevity. Moreover, the artificial kidney is not a desirable alternative for situations where transplantation is indicated. The artificial kidney (*i.e.*, chronic dialysis) can maintain normal blood electrolyte values but some functions of the normal kidney cannot be duplicated and are not restored. Following transplanation, the patient is more alert, has more stamina, and is free of the umbilical cord tying him to the machine every week.¹⁷

Today, renal transplantation is no longer an uncommon event. Since 1955 more than 1,000 people have received kidney grafts. The results are still unpredictable since the rejection phenomenon has not been entirely defeated. However, on the average, a patient receiving a kidney homograft today can expect at least two years of normally active life. It has been predicted that if research is maintained at the present rate, medicine should within a decade be able to give its patients something approaching a normal life expectancy.¹⁸

To the present, the major problem confronting the transplant surgeon has been the rejection phenomenon—the process by which the recipient's body destroys the implanted tissue or organ as a functioning unit. It is generally conceded now that the solution to this problem is practically within reach.¹⁹ Once the rejection phenomenon is overcome, the acquisition of useful and viable organs in sufficient numbers may well become a central problem in this area.

Looking into the future one may confidently expect that lungs, livers, and hearts will come to be transplanted just as kidneys and corneas are now.²⁰ The technical requirements of obtaining these unpaired organs brings us back full circle to the question of death, what it is and what it means.

Outside of the context of transplantation surgery, the problem of defining death has been described as follows:

In the first place, death cannot be defined as the loss of all vital functions because tissues removed from the body can be kept alive in cultures for possibly hundreds of years. Secondly, many people are now maintained in a sort of twilight state by the use of machines which do the work of their lungs or their

¹⁷ MEDICAL ETHICS, *supra* note 11, at 62.

¹⁸ *Id.* at 186.

¹⁹ Billingham, *Tissue Transplantation; Scope and Prospects*, 153 SCI. 266, 269 (1966).

²⁰ MEDICAL ETHICS *supra* note 11, at 63-64.

heart while they are completely unconscious. Everybody treating accident cases and neurological cases is familiar with this fact. Many of these people will never resume an independent existence away from the machine, but they can't stay on the machines forever and ever. There just aren't the machines. There isn't the space to park these people. One has to decide therefore when to switch off the machines, and this question arises quite independently of considerations about transplants.²¹

Dr. Schriener has suggested that:

We may be developing a moral problem in the opposite direction. We have seen patients with a virtual transection of the brain kept alive for days and days simply because there was an intact cardiovascular system and a respirator. The problem is that the clinician or physician has to decide, from a set of criteria, at which point he will stop employing extraordinary means for the prolongation of life. Some research on the criteria is essential, not just for transplantation but to decide how many ribs to break for cardiac massage, or how many old people should unnecessarily be subjected to thousands of dollars worth of resuscitation, or whether it is ever possible to die without a series of cardiac arrests.²²

This is as far as the science of medicine can take us in our effort to articulate a concept of death. The physician cannot define death, but he can and has provided us with the factual foundation around which our discussion will resolve.

We have been confronted with the following facts. First, the cells of the body die at differing rates once their supply of oxygen has been interrupted. Second, the more highly organized the cell the more quickly it will be destroyed by a lack of oxygen. Third, the most highly organized cells in the body are found in the cerebral cortex of the brain. This area of the brain might well be termed the "center of consciousness." Fourth, certain organs such as the liver, heart, and lungs are only slightly less susceptible than the brain to the effects of anoxia. Fifth, at the present state of medical technology or that which may be expected to develop within the next five years, it will be possible to transplant all of the major organs of the body, other than the brain itself, from one person to another. Sixth, many of the organs for transplantation must be acquired from cadaver donors since life cannot be sustained in their absence. Seventh, in the medical profession the traditional criteria for determining death have been an absence of respiration and heartbeat for about five

²¹ *Id.* at 71.

²² *Id.* at 73-74.

minutes. And eighth, machines and procedures are in common use today which will aid or even completely take over the functions of respiration and heartbeat.

From these facts, it is possible to formulate several concepts of death. If the concept of life is felt to imply that it must have or be capable of having some meaning to the actor, the concept of death must be tied to brain function. At the point where sufficient brain damage has occurred to preclude the possibility of psychic functioning, the patient has become "brain dead." On the other hand, if the concept of life implies no more than physiologic existence, the definition of death must be tied to the function of circulation, *i.e.*, the heart.

III. THE LEGAL PROBLEMS

The legal system has had no compelling reason in the past to articulate a concept of death. The gray area, described in the first part of this paper, simply did not exist until recent medical advances made it possible to maintain a patient in this state. Consequently, defining death has not been a problem for lawmakers. Very little legislation refers to death and that which does, does not define it. For example, a review of the Pennsylvania statutes will reveal the implicit assumption that one knows when a person is dead. The statutes provide only that no person may "sign a death certificate" unless "he or she has . . . first received a certificate of licensure from the board (of medical examiners) . . ." ²³ A "dead body" is defined as "(i) a lifeless human body, or (ii) such parts of a human body as permits a reasonable inference that death has occurred." ²⁴ One will search the Pennsylvania and Ohio decisions in vain to find a definitive judicial formulation of the meaning of "death." In the courts, death has been treated as an objective fact to be established by a doctor's certification or other competent evidence.

The closest the law comes to defining death is to raise a presumption of death in those cases where no body can be found, whether because of desertion or some other event. ²⁵ This is not a definition;

²³ PA. STAT. ANN. tit. 63, § 401a (1963).

²⁴ PA. STAT. ANN. tit. 35, § 450.105 (1964). Ohio law does not even attempt a definition.

²⁵ See *Grouer v. Supreme Tent of Knights of Maccabees of the World*, 265 Pa. 129, 108 A. 437 (1919) (Insured traveled but kept in contact with wife; letters stopped in 1909; extensive efforts to locate him; wife sues on insurance policy; *held*: insured comes within rule that seven years' unexplained absence raises presumption of death.); *McNulty v. General Am. Life Ins. Co.*, 153 Pa. Super. 288, 33 A.2d 796 (1943) (Insured

it is merely a legal assumption that "death," whatever it is, has occurred.

Another problem facing the courts has been to establish the time of death.²⁶ In deciding this issue, the courts have adopted the operative concept of clinical death,²⁷ if for no other reason than that no other concept has been available.

The issue of when death has occurred, or if it has occurred, has come up in the context of an action by third parties to determine rights in property or similar contexts. More precisely, the courts have been asked to decree that those legal rights and duties which are altered at a person's death shall be determined as if the person were

left home April 1934; last located September 1945; *held*: rule of seven years' unexplained absence operated to raise presumption of death); *In Re Hoffman's Estate*, 8 Erie 19 (Pa. Orphans' Ct., 1925) (Daughter of decedent not heard from for 30 years; no evidence to show that she had not married in interval or had children; *held*: her share of mother's estate paid into daughter's estate and letters of administration to issue on daughter's estate.); *Tilton's Petition*, 46 Birks 265 (Pa. Orphans' Ct., 1954) (Petitioner's husband drafted in German Army; wrote weekly until August 20, 1944; not heard from since in spite of inquiries; *held*: husband presumed dead as of August 31, 1944, and petitioner's marriage license directed to be issued). *See also* *Brunny v. Prudential Ins. Co.*, 151 Ohio St. 86, 84 N.E.2d 504 (1949) (Suit by *W* on *H*'s life insurance; *H* left home in 1936; *H* last heard from in 1936; *H* declared dead by Probate Court in 1943; defendant introduces deposition taken in 1946 of person claiming to be *H*; *held*: presumption of death overcome); *In Re McWilson's Estate*, 155 Ohio St. 261, 98 N.E.2d 289 (1951) (son disappeared from home in 1936; not heard from again; father brings proceedings to declare him dead; *held*: presumption of death arises since son not heard from for over seven years and presumption of death arises in 1949, date of Probate Court's final order, under Ohio General Code § 10509-25.); *White v. Indus. Comm'n.*, 102 Ohio App. 236, 142 N.E.2d 549 (1956) (*H* marries *W*₁ in 1923; separated one week later; *W*₁ never heard from again; *H* married *W*₂; *held*: *W*₁ presumed dead, not having been heard from for over seven years, and therefore, *W*₂ is *H*'s widow.)

²⁶ *See* *Freiberg v. Schloss*, 50 Ohio Op. 156, 112 N.E.2d 352 (1953) (Alice Seeman deported from her home in Wurzburg, Germany to Poland in 1942 under circumstances to convince court that she was executed shortly thereafter; *held*: date of death set at 1942 rather than seven years later). *See also* OHIO REV. CODE ANN., § 2105.1 and § 2121.01 *et seq.* (Page 1968); *In Re Metzger's Estate*, 140 Ohio St. 50, 42 N.E.2d 443 (1942); *Ostrander v. Pierce*, 129 Ohio St. 625, 196 N.E. 670 (1935).

²⁷ *Compare In re Kimmey's Estate*, 326 Pa. 33, 191 A. 47 (1937). (Driver lurched toward wife; car went off road and over ravine into river; less water found in husband's lungs than wife's; driver had history of heart disease; car skidded before going over ravine; *held*: Insufficient evidence to establish that wife survived husband.), *with In Re Saligman's Estate*, 130 D & C 2d 432 (Pa. Orphans' Ct., 1957). (Witness saw husband and wife just after fire; husband cold to touch and not breathing; wife warm and breathing; doctor arrived 25 minutes later and declared both dead and had no opinion as to who died first; *held*: wife survived husband, thus becoming sole owner of property held by the entireties with husband.).

dead, and to state the date from which these rights shall be so determined.

The advent of resuscitative devices has presented the law with a set of entirely new problems; these center on whether a doctor may terminate therapy to a brain-dead patient. The line between life and death is no longer sharp or clear. Most important, however, the time of death may be conditional and dependent upon forces outside, rather than inside, the patient, such as availability and efficiency of special hospital equipment and decisions as to its use or discontinuation. Furthermore, decisions concerning such use or discontinuation may be influenced by the physician's concept of life and death.

This is not the only important aspect of the problem of defining "death." The future of transplantation surgery is in the balance, at least with respect to the use of some of the vital organs. The period of time during which these organs remain viable after circulation stops is measured in minutes. Thus, whatever concept of death is adopted, it must be capable of being discerned within the period during which the most sensitive organ can survive without oxygen, unless we are prepared to make the transplanation of this organ, and perhaps others, impossible. In this field we are concerned with the fate of both the donor of the organ and the recipient.

In the background of any discussion of death is the question of public confidence in our hospitals and the medical profession itself. Even the basic principles of medicine are not well understood by the average person—the future patient. He has been brought up to believe that heartbeat and respiration are synonymous with life and their absence with death. Now he is to be told that a person can have a heartbeat and respiration and be dead, and this on the basis of principles with which he is not conversant. Whether the average layman will accept this proposition, even after an appropriate educational effort, cannot be answered here. In any case, one may consider whether the legal system could be useful in legitimating the concept of brain death.

Finally, the place of the courts relative to the regulation of the practice of medicine must be pondered. Courts have recognized that they are not proper institutions to determine alone what standard of care a physician must meet in ministering to his patient. When faced with the necessity of deciding issues of this kind, the courts have looked to the standard of medical practice in the community.²⁸

²⁸ Robinson v. Wirts, 387 Pa. 291, 127 A.2d 706 (1956); *but see* Smith v. Yohe, 412 Pa. 94, 194 A.2d 167 (1963). Cf. Rush v. Akron General Hospital, 84 Ohio L. Abs.

The standard of death which a physician uses is founded on medical principles blended with experience. How is a court to evaluate his judgment and at what stage, before or after termination of treatment? What kind of action can a court take when it disagrees with the physician's diagnosis of death? These are only two of the most obvious questions that must be answered if the legal system is to take a more active role in regulating even this aspect of medical practice through the instrumentality of its courts.

Below we shall explore the threshold question of whether the concept of death is merely a question of medical judgment or whether the law has independent interests of sufficient consequence to warrant an attempt to articulate its own concept of death.

A. *The Physician's View*

Some have suggested that determining the point at which death may be said to occur is solely a medical question. It is pointed out that the physician's entire life is dedicated to the struggle to prevent, or at least postpone, death. To this end the physician treats his patient. In this view, the physician is in the best position to know when the struggle has been lost—when his patient is dead.

Closely related to this point is the conceded fact that, whatever the definition of death, informed and experienced medical judgment is necessary to diagnose when death has taken place. Here a logical distinction should be made between defining the point at which death may be said to occur and the method of determining if a given patient has reached that point. The diagnosis of death is clearly within the area of medical judgment; no one else is competent to make this decision. The concept of death must equally be founded upon sound medical principles and be capable of modification as medical advances are made. One of the physician's greatest fears centers on the possibility of uninformed legal decisions in this area or the inability of the law, if it once sets a definition of death, to respond readily to medical advances. Neither fear is unfounded.

A French decree issued in 1948 by the Minister of Health and Population²⁹ set forth several rules relating to the certification of death. According to these rules, apparently still in force, death must be declared by two physicians and the early diagnosis of death is to

292, 171 N.E.2d 378 (1957); *but see* Morgan v. Sheppard, 91 Ohio L. Abs. 579, 188 N.E.2d 808 (1963).

²⁹ From an abstract of a decree signed by the Minister of Health and Population, February 3, 1948, in Paris, France.

be established, in addition to direct examination, by two methods. The first is arteriotomy and the second, injection of fluorescein, a dye. The instructions state that the radial or temporal artery is to be incised with a scalpel. Should blood fail to flow, it is recommended that another arteriotomy on the opposite side of the body be made before making a finding of death. A fluorescein test is also recommended but not insisted upon, whereby an intravenous injection of fluorescein is made. If the patient is alive, the conjunctiva and mucosa of the eye will take on a greenish-yellow coloration within one half hour.

Such a test might have been appropriate in 1948. The effect of insisting upon such a procedure now is to require that a patient be maintained on a respirator, or other resuscitative devices, whether or not the patient has any chance of recovering consciousness. This problem was not even envisaged, in all probability, when the decree was drafted. If the fluorescein test is used, the development of transplantation surgery will be severely hampered since several organs are not viable after such a long ischemic interval.

While this example has dealt with statutory and administrative law, the question of what the courts, as legal institutions, can do in solving the problems raised by the new techniques of resuscitation must still be faced. Maintaining the physiologic functioning of a patient who has undergone irreversible cerebral damage is not a mere matter of keeping the respirator on; this treatment requires continuing decisions relative to maintaining proper blood electrolyte levels and maintaining body temperature and blood pressure within acceptable limits. It is precisely in the field of treatment where the courts have deferred to the expertise of the physician. Yet, the spectre of a court directing a physician to continue to treat a patient, in spite of the fact that the physician is convinced that the patient will never regain consciousness, is quite possible if the courts enter the area of defining death. A court is not equipped for such a venture. How would such an order be drawn up? What would be the physician's duties during the various emergencies that arise when treating patients of this kind? When could the physician declare the patient dead? It is clear that the court must rely upon the integrity of the physician treating the patient. Ultimately, the patient's fate lies in the skill and knowledge of the treating physician.

One may wonder whether the medical profession will come to a working concept of death which is significantly different from that which an informed judge or legislature would adopt. If the medical

definition would be substantially the same, the legal system would be well advised to ratify that definition as appropriate, leaving medicine ample leeway for future development.

Finally, it is suggested that the fundamental concept of death has not undergone a change. One medical dictionary defines death as "the *apparent* extinction of life *as manifested by* absence of heart-beat and respiration."³⁰ (Emphasis added.) Notice that death is not defined *as* the absence of heartbeat and respiration. Basically, this definition requires the permanent nonfunctioning of (*i.e.*, irreversible damage to) a vital organ. Historically, concern has centered on the heart. If this function could not be maintained, the patient lapsed into unconsciousness very quickly and brain function ceased shortly thereafter. Attention has centered on heartbeat and respiration because their permanent interruption caused other, immediate consequences to brain function. Given a patient with cardiac arrest, other things being equal, the doctor will attempt to revive heart action for perhaps six minutes. Yet, we know that the muscle tissue of the heart is viable for a period of significantly more than six minutes. In deciding when to stop his efforts, the physician is considering when, in his judgment, the brain cannot resume functioning.

Total kidney failure, absent mechanical intervention, will have the same ultimate result. However, the *dying* patient will remain conscious for an extended period, lapse into a coma, and then undergo clinical death. The time sequence and physiologic mechanism of death are totally different from that connected with a cessation of respiration or heartbeat but are just as sure. The important difference for our purpose is brain function. If this view is proper, then, the continuation of vital functions, including heartbeat and respiration, is pointless if the patient cannot regain consciousness. This much is implicit, on one reading, in the concept of clinical death.

B. *The Lawyer's View*

Others would suggest that the issues involved in defining death go well beyond the teachings of any science, even medicine. They would say that the purpose for which scientific techniques or principles are used must be defined on the basis of normative, ethical and moral principles.

When medicine adopted the standard of clinical death, the

30 DORLAND, ILLUSTRATED MEDICAL DICTIONARY 387 (24th ed., 1965).

propriety of its action could not be challenged on the basis of such principles. Medicine was simply recognizing what nature had ordained: Life could not continue absent heartbeat and respiration. Now, however, medicine has begun to restore the function of vital organs or compensate for their nonfunction. In this new context medical decisions are being made which are based not on "scientific" fact but on the physician's concept of life and death. A determination of when life is meaningful to its possessor seems to be at the foundation of the decisions concerning when to terminate therapy. But the question of when life is meaningful has been debated by theologians and philosophers for centuries; no agreed conclusion has been reached.³¹

Today's religious leaders, however, do appear to agree that the concept of brain death is permissible. Pope Pius XII gave the Catholic position when he said that human life continues for as long as the vital functions are carried on spontaneously without the help of artificial means. He was asked in 1957 at what point a doctor could stop artificial respiration to a patient who he was convinced could never regain consciousness. The Pope replied that the respirator and other systems for aiding circulation were extraordinary systems for prolonging life and that physicians were not obligated to give extraordinary treatment. During an

attempt at reanimation . . . the family may insist that the physician interrupt his efforts and the doctor can obey . . . even when it involves the stopping of the circulation of the blood.³²

Rabbi Immanuel Jakobovits, an authority on Jewish ethics, has written that Jewish law permits, and sometimes even requires, the withdrawal of any medication and of any other efforts that delay death for a person suffering with an incurable disease.³³

The theologians have said only that the idea of equating brain death with "death" is permissible. They have not indicated who is to make the ultimate decision. Is it to be the relatives, the physician, the physician on the advice of the relatives, et cetera? What if the relatives are divided on the subject? None of these questions has

³¹ See generally Guttentag, *The Meaning of Death in Medical Theory*, 17 STANFORD MEDICAL BULLETIN 165 (1959).

³² Pope Pius XII: Allocution Delivered to the International Congress of Anesthesiologists, November 24, 1957, 49 *Acta Apostolica Sedis* 1027; cited in Hamlin, *Life and Death by EEG*, 190 J.A.M.A. 112, 121 (1964).

³³ Kitay, *TODAY'S HEALTH*, 62-69 (May 1966).

been answered as yet. Many hospitals require the tacit consent³⁴ of the relatives before discontinuing treatment to the brain-dead patient. Under such conditions few objections may be expected, but as advances in resuscitation become more widespread, one may question whether physicians will be willing to continue treatment of such patients when the relatives refuse to accept the standard of brain death. One may also ponder the legal vulnerability of hospitals and physicians who do not presently require the express consent of relatives as a condition precedent to the termination of treatment.

One may well question why the relatives are consulted at all in this situation. If the brain-dead patient is not "dead," how can a relative's consent legitimate the withdrawal of treatment? If such a patient is "dead," the relative's consent is irrelevant. On balance, it is suggested that we are witnessing a transition in the concept of death. The medical profession is being quite solicitous of the relatives' feelings as well as trying to protect itself.

A second difficulty centers on the question of whether the interests of the organ donors and recipients are inconsistent. If the law is to sanction the solicitation of an individual's consent to allow the removal of vital organs from his body immediately after death, it should insist that all necessary steps are taken to assure that such person is not deprived of even the least chance of survival because of the need for an organ. Assuming that insistence upon the standard of clinical death would hinder the development of transplantation surgery, the thrust of our concern as it relates to the concept of brain death is whether this standard is too difficult of proof. It is one thing for a physician to diagnose the existence of the state of brain death where the only question involved is the continuation or termination of treatment. It may be a different matter when the doctor knows that another patient will die shortly unless he receives a new organ and that the only source of this organ is the physician's patient. The unconscious and unarticulated forces at work in the diagnosing physician might well determine his diagnosis in a close case.

To the extent that one feels that this conflict is a significant problem, one will attempt to find a mechanism for reviewing the doctor's determination of death or insist that the standard of clinical death be used. The difficulties involved in resolving this problem satisfactorily by legal means will be brought out in the hypothetical situations to be discussed in the next section of this paper.

³⁴ This is not the written consent of relatives but rather a "sense" on the part of the physician that they feel that discontinuation of treatment would be appropriate.

Finally, the possibility of two concepts of death developing around the one word "death" presents disquieting possibilities. If the medical profession were to become divided, some doctors applying only the standard of clinical death, and others using the standard of brain death in appropriate circumstances, a serious problem of public confidence might develop and force the law to act. This kind of division within the medical profession would almost certainly lead to a crisis of confidence in medical treatment among laymen. The patient has a right to know what standard is going to be used in determining whether to continue treating him.

Such a division would also present the question of whether a patient could choose for himself the standard to be applied and bind the physician and hospital as to its use. In the past, the law has provided that the physician is free to carry out his professional duties as he sees fit.³⁵ But, it is a different matter to allow him to decide when life has lost all meaning to his patient, particularly if the medical profession is divided on the subject.

Implicit in the considerations just discussed is the thought that traditional acceptance of the physician's freedom of action rests in large part in a deference to his expertise. Such deference is seriously undermined to the extent that one comes to feel that the decision of where to set the point at which a person may be declared dead, while requiring a knowledge of medical principles, rests on non-medical considerations.

It is suggested that the proper function of the law relative to defining death is dependent upon the nature of the question being asked. For example, a court may well feel that it is appropriate to examine the circumstances under which an organ is about to be removed from a donor for transplantation and yet be unwilling to review a physician's determination that further medical treatment of a patient is useless because the patient is brain-dead when nothing more is involved.

C. *Hypotheticals*

The difficulties facing the legal system as it determines its response to the new questions created by advances in the field of resuscitation can be illustrated by posing four hypothetical situations and examining some of the legal questions presented by each. In this way it is possible to frame the more important issues as they would arise in a legal proceeding and to find out how the relevant medical,

³⁵ *Donaldson v. Muffucci*, 397 Pa. 548, 554, 156 A.2d 835, 838 (1960).

legal, and social policies affect the resolution of the controversy. In this manner it should be possible to specify what interests the legal system has in the concept of death.

Case 1. The patient is a 17-year-old boy. He is in good health except for an inflamed appendix. Toward the end of the operation to remove the appendix, his heartbeat and breathing stop. No effort is made to restore heart function or to ventilate the patient. The parents sue the physician in charge of the operating room for malpractice in that he did not immediately institute resuscitative measures.

Here there would be no disagreement between the medical and legal professions. The physician is guilty of malpractice.³⁶ In an action at law it would be significant, if not decisive, that the failure to institute resuscitative measures is contrary to general medical practice, particularly where, as here, there is every reason to believe that the measure would be successful.

Resuscitative measures are not only appropriate but virtually mandatory, because the patient must still be alive for some period after his heartbeat and breathing stopped. Otherwise, it would be pointless to attempt resuscitation and the failure to institute such measures could not be the basis for a legal action.

This first hypothetical was chosen to begin our discussion in a context where the medical and legal professions are on common ground. It also illustrates a point of importance; it is implicit in the requirement that resuscitative measures be attempted in a situation of this kind that the cessation of heartbeat and breathing does not in itself constitute death. Both medicine and the law must be looking to some other standard in deciding if the patient is dead. The only criterion which this writer can envisage is the possibility of continued brain function, combined with the possibility of resumed functioning of the vital organs (here heart action and breathing).

Case 2. On the first of March the patient suffered a ten-minute interruption in circulation, at which point heart action was successfully re-established; breathing was carried on with the aid of a respirator. The patient's condition continued without improvement for two weeks. On the 14th of March, the treating physician, after consulting with several of his colleagues, concluded that the patient had no chance of regaining consciousness because of irreversible damage to the cerebral cortex. Upon being informed of this con-

³⁶ Cf. *Quintal v. Laurel Grove Hospital*, 41 Cal. Rptr. 577, 397 P.2d 161, 165-67 (1965).

clusion, the relatives insisted that the physician continue to treat the patient. It is now March 25th and the physician has just notified the relatives of his intention to terminate all treatment on the 27th of March.

Several legal questions immediately present themselves. First, can the next of kin prevent the physician from carrying out his intention to terminate treatment.³⁷ Basically, we are asking whether a court should grant an injunction prohibiting the termination of treatment by the physician.

The court is squarely faced with the question of whether it can usefully act. The uncontested medical testimony is that the patient cannot regain consciousness. Consequently, the defendant physician has concluded that further treatment is of no value to the patient. Moreover, to maintain a patient in this condition will require continuous and complex treatment by the medical staff. On what basis is a court to override this determination and require further treatment? There must come a point after which further treatment is useless—where the physician has lost his battle against death.

It is arguable that the court is faced here with deciding two more narrow questions, to wit: Is this patient, who is in a fairly stable condition, "dead," or is he sufficiently hopeless, although "alive," to permit the physician to terminate treatment? Petitioner may well argue that since the condition of the patient is stable, it cannot be said that his condition is so hopeless that a physician can reasonably decide to cease treatment. We are not here counting broken ribs in an emergency situation; we are dealing with a stable condition. Consequently, the real decision being made by the physician is that life is no longer meaningful to his patient. This is not a medical decision.

Although this contention is appealing, the condition of the patient is not as stable as it may appear to the layman. The patient's current state is maintained only by continuous therapy designed to assure the proper biochemical balances required for metabolism. It is not uncommon for patients in this condition to suffer frequent medical emergencies. In the event that an order were issued directing further treatment, what would it require of those treating the patient during one of these emergencies? When an emergency occurs, the physician is in no position to ask for clarification of the order or to relitigate the issue of death.

³⁷ It is assumed that it is not practical to dismiss this physician and substitute another in his place.

On balance, a court would be unwise to issue an injunction requiring the physician to continue the treatment of his patient under these circumstances. To do so, a court would come perilously close to entering the practice of medicine, a task for which it is not equipped, either professionally or institutionally. A philosophical problem is involved here, but the practical requirements of medical practice appear to be decisive. A court is not familiar with the myriad details arising in the maintenance of such a patient and, more importantly, with the varying situations which might develop after an order is entered. This is at least part of the reason that courts have adopted the standard of conformity to professional custom when determining malpractice cases. The reason of the rule is equally applicable here.

It is pertinent to note here that a case similar to the hypothetical came before a Swedish court in 1960, in the form of a criminal prosecution. The physician was acquitted by the district court with the comment that "further administration of fluid could have served no medical or human purpose."³⁸

The second type of legal question which may arise in this hypothetical case is whether the patient, a legatee, survived a testator who died on the 26th of March, assuming that the physician did terminate treatment to the patient on the 27th of March. In deciding this question, the court must set the time of death. The two most likely times for denomination as the "moment of death" are the 14th of March, when the physician diagnosed the patient's condition as including irreversible brain damage, and the 27th of March, when clinical death occurred after the respirator was disconnected.

The case of *Smith v. Smith*,³⁹ provides a point of departure for analysis. In this case, Mr. and Mrs. Smith were fatally injured in an automobile accident on April 19, 1957. Mr. Smith died at the scene,

³⁸ The facts of the case are given in *MEDICAL ETHICS*, *supra* note 11, at 142-43. It was there stated that:

In December, 1968, an 80-year-old woman with cerebral hemorrhage was admitted to the Department of Internal Medicine of a hospital in northern Sweden. She was unconscious and remained so. For two months she was given fluids by the drip technique. After a brief improvement in her condition there was a deterioration. In a conversation with the physician the relatives expressed their doubt as to whether there was any point in continuing the treatment, which could not lead to her recovery. The physician agreed and acted accordingly. (He discontinued the drip.) A week later the patient died peacefully.

³⁹ 229 Ark. 579, 317 S.W.2d 275 (1958).

but efforts were made to resuscitate Mrs. Smith until May 6, 1957. At no time did Mrs. Smith regain consciousness. Each left a will leaving his or her property to the other. The administrator of Mr. Smith's estate petitioned the probate court for a construction of both wills. He alleged, *inter alia*, that both lost the power to will, power to administer the estate of the other, and power to enjoy the estate of the other at the same time. Since both lost all of these powers at the same time, both lost the power to accept the bounty of the other under the reciprocal wills.⁴⁰ The administrator of Mrs. Smith's will demurred. The probate court sustained the demurrer. On appeal the lower court was affirmed.

One of the allegations in the petition for construction of the wills reads as follows:

THAT the said Hugh Smith and his wife, Lucy Coleman Smith, were in an automobile accident on the 19th day of April, 1957, said accident being instantly fatal to each of them at the same time, although the doctors maintained a vain hope of survival and made every effort to revive and resuscitate said Lucy Coleman Smith until May 6, 1957, when it was finally determined by the attending physicians that their hope of resuscitation and possible restoration of human life to the said Lucy Coleman Smith was entirely vain, and

THAT as a matter of modern medical science, your petitioner alleges and states, and will offer the Court competent proof that the said Hugh Smith, deceased, and said Lucy Coleman Smith, deceased, lost their power to will at the same instant, and that their demise as earthly human beings occurred at the same time in said automobile accident, neither of them ever regaining any consciousness whatsoever.⁴¹

On this point, the Arkansas Supreme Court, after quoting the definition of death found in Black's Law Dictionary,⁴² stated:

Admittedly, this condition did not exist, and as a matter of fact, it would be too much of a strain on credulity for us to believe any evidence offered to the effect that Mrs. Smith was dead, scientifically or otherwise, unless the conditions set out in the definition existed We take judicial notice that one breathing, though unconscious, is not dead.⁴³

⁴⁰ *Id.* at 586, 317 S.W.2d at 279.

⁴¹ *Id.* at 582-83, 317 S.W.2d at 277.

⁴² "The cessation of life; the ceasing to exist; defined by physicians as a total stoppage of the circulation of the blood, and a cessation of the animal and vital functions consequent thereon, such as respiration, pulsation, etc.," *Id.* at 586, 317 S.W.2d at 279.

⁴³ *Id.* at 587, 317 S.W.2d at 279, 281.

The Arkansas court was not prepared to make the time of death retroactive to the time of injury causing death.

Although a court may not be willing to make death retroactive in the sense attempted in *Smith v. Smith*, it must still determine the moment of death for the purpose of determining inheritance in our hypothetical. Moreover, it is clear that the medical considerations, so important in passing on permissible conduct by the physician toward his patient, are of much less consequence. Here it is desirable to adopt a standard of death that is easily perceptible in order to discourage undue litigation and provide substantially consistent results.⁴⁴ For this purpose, the court might well define death in terms of heartbeat and respiration when deciding survivorship claims.

Case 3. The same medical situation exists as in case 2 above. However, upon being informed of his wife's condition on the 14th of March, the husband wishes further therapy to be stopped and the physician refuses. The physician has concluded that the patient is unable to recover consciousness, but he is unwilling to terminate treatment prior to clinical death. It is assumed that the husband is contractually liable for the medical expenses of his wife.

If the husband refuses to pay the physician's bill for services, the first issue presented is whether the husband can raise the defense of his wife's "death" in opposing the doctor's suit for payment. There are certain attractions to admitting such a defense. The physician-patient relationship is dissolved upon the death of the patient. The cost of maintaining a person in the twilight state is very high—approximately \$150 per day. To take the position that a person liable for the medical expenses of another must pay the cost of maintaining the patient in this hopeless condition may well result in the bankruptcy of that person and his family, simply because the treating physician declines to recognize the standard of brain death as "death."

It might be suggested that a result of allowing this defense would be to give the person contractually liable for the medical expenses of another the practical power to decide whether the patient, in this situation, shall receive treatment. Obviously, if the courts were to hold that establishing the state of brain death constituted a defense to further liability for medical expenses, physicians would be hesitant to continue treatment in this situation. The standard of brain death would indirectly be ordained by the courts as the operative

⁴⁴ Many jurisdictions have enacted simultaneous death statutes for this very purpose. See, e.g., OHIO REV. CODE ANN. § 2105.21 (Page 1968).

definition of death, unless the physicians and hospitals were prepared to underwrite the costs of continued treatment of such patients.

If we are convinced that the standard of brain death is medically proper, then why should not this defense be permitted? Since the issue of brain death is in the nature of an affirmative defense, the defendant would have the burden of proving that this condition did exist. Thus, if there were any significant dispute as to the condition of the patient, the court should find that the defense was not established. Indeed, because of the difficulty of diagnosing the state of brain death,⁴⁵ and the consequences with respect to the discontinuation of treatment following such a diagnosis, it would be wise to require the defendant to meet a higher burden of persuasion in establishing this defense than is normally involved in contract actions. This procedure should not place any more of a risk on the physician than he presently has regarding the correctness of his diagnoses. Allowing this defense, although requiring a high burden of persuasion, might also prevent the evolution of two standards of death growing up around the word "death."

If this defense is recognized and established in a given case, one may speculate as to when the patient "died" for the purpose of determining a survivorship claim. If, for example, a court held that the patient in our hypothetical had reached the state of being brain-dead on March 14, when the doctor diagnosed the condition, could the court hold consistently that, for the purposes of a survivorship claim, the patient died on March 27, when heart action and respiration ceased? Nothing more can be said here that was not noted above. However, the paradox of being "dead" for one purpose and "alive" for another purpose is brought into sharp relief.

Case 4. The patient has been diagnosed as brain-dead and is being maintained by a respirator. The treating physician and the relatives agree that treatment should be terminated. The patient has donated his organs for transplantation. Consequently, treatment is continued so that the recipient can be prepared for surgery. Twenty-four hours after the patient's condition was diagnosed, his liver is removed and implanted into the recipient. After the operation, therapy to the patient is terminated and clinical death takes place.

One problem presented here is whether the diagnosis of brain death is a sufficient basis to support the removal of the patient's vital organs. We have already concluded that this diagnosis will permit

⁴⁵ Hamlin, *Life or Death by EEG*, 190 J.A.M.A. 112, 120 (1964).

the treating physician to terminate all treatment to the patient. If we are to say that it will not permit the transplant surgeon to remove an organ, we must be asserting that only the clinical death of the patient will support such a procedure. The treating physician can "cause" the clinical death of the patient but the transplant surgeon cannot remove a vital organ before clinical death occurs. Surely such a result is absurd.

Presumably, after clinical death, the transplant surgeon would be permitted to restore circulation and respiration in the donor for the purpose of maintaining the viability of the organs.⁴⁶ Requiring the patient to undergo clinical death is pointless. The only possible reason for this requirement would be to be sure that the donor was really dead. But, if we are not certain of his death, we have no basis whatever for permitting the physician to discontinue treatment.

It may be asked whether a court should be consulted with respect to declaring a patient dead when the removal of an organ is contemplated. The standard of brain death may be acceptable, but might the physician have a conflict of interest? On the one hand, he has a patient whose life can be saved by the transplantation of an organ and, on the other hand, he has a patient who has only the most remote chance of survival.

This very difficult situation and the dangers inherent in it has been recognized by the medical profession. There is little question but that it is unethical for a physician to treat both the donor and recipient. Only after the donor's physician has given up hope and diagnosed the state of brain death can the transplant team ethically act or otherwise intrude itself upon the scene.

Yet, there may be a lingering suspicion: a sense that there is a latent conflict of interest in the physician treating the prospective donor which is affecting his judgment of the patient's condition. It might be suggested that a court entertain a motion by relatives for an injunction to prevent the transplant. This would assure that some review of the physician's judgment would be available. However, if such a procedure is made available, its operation must not be so cumbersome that the organs to be transplanted are no longer viable by the time the decision is made. A judge might well hold a hearing at the hospital to determine whether the donor's physician's

⁴⁶ The consent of the patient to the removal of his organs at death would probably be construed to carry with it permission to perform those procedures necessary to maintain the viability of the organs until the time of transplantation. *See* OHIO REV. CODE ANN. § 2108.01-.03 (Page 1968).

judgment of brain death is reasonable. If the court feels that the physician has, more likely than not, allowed his judgment to be affected by the knowledge of the recipient's plight, then it should be sufficient to remove the basis of the conflict by enjoining the transplantation.

There are at least two major defects to this solution. First the physician's decision would be reviewed only if the patient had relatives who were prepared to question the diagnosis. Second, the court is dealing with a field in which it does not itself have professional competence, and is doing so under emergency conditions. The court is not the ideal institution to deal with the problem, but, in the absence of legislation, it may be the only available institution.

The most appropriate solution to the difficulty of achieving a meaningful review of the treating physician's determination of brain-death lies in the legislative sphere. Rather than involve a court in the process at all, it would be more efficient to establish a board of physicians⁴⁷ within each hospital to make the determination of brain death. Such a board could be composed of three members chosen from the staff of the hospital, of whom one would be an anesthesiologist, one a neurologist, and one a specialist of internal medicine. Where one or more of these specialists is not available from the hospital's medical staff, the position should be filled by an outside physician from the relevant specialty chosen by the members of the hospital staff.

It would be the duty of this board to meet upon the call of any physician who had a patient in the hospital and who he concluded had reached a state where consciousness could not be regained.⁴⁸ The only question before the committee would be whether, in its opinion, the patient had reached the point where he could not regain consciousness. To this end, the board could examine the patient and have access to any records which it deemed relevant. Only if the board concluded, by unanimous vote, that the patient was brain-dead would the treating physician be free to discontinue treatment to the patient. If death were determined to have occurred the transplant surgeon, with the permission of the treating physician,

⁴⁷ With respect to analogous boards dealing with abortions see COLO. REV. STAT. ANN. §§ 40-2-50 to -52 (1967); 14 N.C. GEN. STAT. § 15.1 (1967). See also Sanders and Dukeminier, *Medical Advance and Legal Lag: Hemodialysis and Kidney Transplantation*, 15 U.C.L.A. L. REV. 357 (1968).

⁴⁸ This procedure would not be applicable in emergency situations; we are considering only the patient in a relatively stable condition. In the emergency situation the treating physician would be on his own.

would be permitted to remove any needed organs from the patient, assuming, of course, the previous consent of the patient.

It should be provided further that the determination of brain death by the board would be conclusive on the subject in any court in the event that the treating physician chose to terminate treatment. If the treating physician refused to terminate treatment after such a finding, any person liable for the medical expenses of the patient should be able to resist further payment of these fees for treatment.

If the board found that the patient might recover consciousness, the treating physician should not be permitted to terminate treatment. In this situation, it would be appropriate for an injunction, commanding further treatment, to issue if needed. The court might rely upon the board, or one of its members, to supervise its order.

Finally, in the event that the treating physician refused to ask the board for its opinion on the question of brain death, it would be appropriate to allow the next of kin or guardian of the patient to call the matter to the attention of the board, leaving it to the board to decide whether or not to act on the matter. In this way the treating physician could not completely foreclose a determination of the question.

Such a board would serve at least two major functions. First, it would assure that prior to termination of treatment, suitable expert judgment was brought to bear on the diagnosis of brain death. Second, it should quiet fears of the latent conflict of interest in the transplant situation. Since the board must act by unanimity, the danger from an unconscious conflict of interest within the treating physician as between donor and recipient is reduced to the minimum possible.

In short, the board of physicians envisaged here will substantially lessen the pressure for judicial intervention in some of the situations previously presented. Review of determinations of brain death could be achieved at an expert level where it will be most effective. At the same time, when judicial intervention is needed, the issues have been molded into a form more easily digested and acted upon by a court. Instead of having to decide whether a patient is brain-dead as an original matter, the court is presented with a narrower issue: whether the board's determination can stand. Moreover, if the court must act to overrule the treating physician, it has

a natural ally in the board of physicians as well as a source of aid in implementing its mandate.

IV. CONCLUSIONS

Several points emerge from our discussion. In the first place, both medicine and the law have the same goal relative to the patient. His chances for recovery, however remote, must be protected and acted upon. The question centers on the goal in the context of a patient who has suffered irreversible damage to the cerebral cortex and who can, therefore, never regain consciousness. Medicine asserts that there is no hope of recovery from this state. What is the function of the law?

In cases of medical malpractice, the courts have deferred to the standard of medical care which is customary in the locality as determinative of the proper standard of care. This practice is based on the frank acknowledgement that the treatment of the patient requires an expertise and skill not possessed by the courts or laymen.

The difficulty with adopting this theory of the court's role, without a close scrutiny of the reasons for doing so, centers in the fact that the medical profession is adopting an apparently novel theory of death. And death, like many other human events, is an event the occurrence of which alters many rights and duties.

The law has come to acknowledge at least three legal considerations involved in the concept of death:

- 1) Cause of death (legally actionable causation);
- 2) Period of dying (pain, suffering, and mental anguish as death approaches); and
- 3) Moment of death (survivorship determinations).⁴⁹

Two other considerations have been suggested:

- 4) Failure or interruption of mechanical devices for sustaining life (malpractice, breach of warranty, and homicide); and
- 5) Failure to provide competent resuscitation procedures after clinical death or during the period of dying (malpractice, breach of warranty, and homicide).⁵⁰

It is implicit in the previous discussion that the latter two considerations are really subdivisions of the determination of the moment of death.

In resolving the problem of defining death, it is suggested that

⁴⁹ Houts and Irwin, *Death*, 3 COURT ROOM MEDICINE 16-17.

⁵⁰ *Id.*

medicine is not adopting a new standard. As noted above, on at least one view, the concept of brain death is implicit in the premises underlying the historical notion of clinical death. Formerly, medicine could not compensate for the failure of respiration and heartbeat and without these brain function could not continue. Presently, medicine's operational concept of death is the absence of heartbeat and respiration for three to five minutes. Within this time limit the failure to institute resuscitative measures would constitute malpractice. The only logical reason for this time factor is that within these limits the cerebral cortex has not suffered irreversible damage and, consequently, consciousness can be restored. The heart can often be started well beyond this time period, as can breathing, but conscious brain function cannot. In this view, the concept of brain death is but the logical application of the idea behind clinical death.

If the law were to attempt to regulate the definition of death, it would encounter an area in which it is not equipped to operate, institutionally or professionally. Indeed, the legal system might be unable to enforce its own orders. Ultimately, only the physician can treat the patient. If the members of the medical profession found a court's rejection of the medical standard of brain death as a legal standard unbearable, they could easily circumvent it. To maintain a patient in this twilight state requires a continuing observation of the patient to the end that the proper biochemical balances are maintained. It would be virtually impossible to prove a violation of the court's order if one of the more critical balances were allowed to get out of control. It is also questionable whether the court could draw up an order that would give the physician meaningful guidance in an emergency situation.

Moreover, there seems to be little reason to believe that the medical profession will adopt a standard that is significantly different from that which an informed and reasonable legislator or layman would reach. There is, then, no reason for the courts to become involved in the process of articulating a concept of death different from brain death.

If the legal system does ratify the concept of brain death, many problems remain to be solved. They center upon determining what legal consequences are to attach to the state of brain death. Some of the more important questions were discussed above. It has not been possible to provide definitive answers, but only to raise the questions and suggest some of the pertinent considerations bearing on their resolution.